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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/600,419
Filing Date: June 20, 2003
Appellant(s): SONG ET AL.

William E. Hunter
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed on 10/30/2008 appealing from the Office action mailed 4/30/2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

1. US patent nos.

7,136,244	Rothberg	11-2006
6,519,715	Takashi et al.	2-2003

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S. C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims **1,2, 9-12, 19-24, 26, 30-35, 43-46, 52-54, 68 and 72-78** are rejected under 35 U.S.C. 102(e) as being anticipated by Rothberg U.S. PN: 7,136,244.

In regard to **claim 1**, Rothberg teaches:

A signal processing apparatus comprising: an input to receive a signal;
(Note: FIG. 1B reference character (14) in Rothberg), a buffer responsive to the input to store the signal; (Note: FIG. 1B reference character (16) in Rothberg)

a detector responsive to the input to interpret the signal as discrete values; (Note: FIG. 2, reference character (24) in Rothberg) an averaging circuit responsive to the buffer and the detector to cause interpretation, by the detector during a retry mode, of a new signal comprising an average of a previous signal stored in the buffer and a current signal; and (Note: FIG. 1B reference character (20) in Rothberg) a control circuit that determines whether the discrete values are adequately indicated based on output of the detector, that initiates the retry mode when the discrete values are not adequately indicated, and that determines whether the discrete values are adequately indicated from the interpretation of the new signal in the retry mode, and (Note: FIG. 1 B, reference character (18) and FIG. 8, reference characters (68) and (72) and col. 8, lines (55-65) in Rothberg) an error correction circuit responsive to the detector and the averaging circuit to provide a signal quality metric that governs which signals are averaged. (Note: FIG. 4 and col. 4, lines (27-58) in Rothberg)

In regard to **claim 2**, Rothberg teaches: The apparatus of claim 1, wherein the signal from the input comprises a read signal received from a storage medium. (Note: FIG. 1 B, reference character (10) in Rothberg)

In regard to **claim 9**, Rothberg teaches: signal processing apparatus, comprising: an input to receive a signal; (Note: FIG. 1B reference character (14) in Rothberg), a buffer responsive to the input to store the signal; a detector responsive to the input to interpret the signal as discrete values; (Note: FIG. 1B reference character (16) in Rothberg) an averaging circuit responsive to the

buffer and the detector to cause interpretation, by the detector during a retry mode, of a new signal comprising an average of a previous signal stored in the buffer and a current signal; and (Note: FIG. 1B reference character (20) in Rothberg) a control circuit that determines whether the discrete values are adequately indicated based on output of the detector, that initiates the retry mode when the discrete values are not adequately indicated, and that determines whether the discrete values are adequately indicated from the interpretation of the new signal in the retry mode; (Note: FIG. 1 B, reference character (18) and FIG. 8, reference characters (68) and (72) and col. 8, lines (55-65) in Rothberg) Wherein the control circuit determines whether the discrete values are adequately indicated based on comparison of interpretations of the new averaged signal and the current signal. (Note: FIG. 4 and col. 4, lines (1-27) in Rothberg)

Claims **12, 22, 34, 45, 53, 64 and 72** are rejected for the same reasons as per claim 1.

Claims **19, 30, 43, 52, 61, 64 and 72** are rejected for the same reasons as per claim 9.

In regard to **claim 10**, Rothberg teaches: The apparatus of claim 1, a wherein the control circuit causes averaging of a defined number of most recent input signals, wherein the defined number is greater than two. (Note: FIG. 2, reference characters (320 - 32n) in Rothberg)

In regard to **claim 11**, Rothberg teaches: The apparatus of claim 1, wherein the control circuit causes the previous signal stored in the buffer to be an averaged input signal when two or more signals are obtained in the retry mode. (Note: FIG. 2, reference characters (320 - 32n) in Rothberg)

Claims **20, 31, 62, 73, 76, 75 and 78** are rejected for the same reasons as per claim 10.

Claims 21, 24, 32, 33, 44, 63, 66, 74 and 77 are rejected for the same reasons as per claim 11.

In regard to **claim 22**, Rothberg teaches; A method of reading data on a channel or media, the method comprising; interpreting an input signal as discrete values; and deciding whether the discrete values have been adequately interpreted from the input entering a retry mode in response to a decision that the discrete values have not been adequately interpreted from the input signal; and an inadequate signal; averaging, in the retry mode, multiple signals to improve interpretation of the input signal including: obtaining a second signal representing same data as the input signal, averaging the input signal and the second signal to produce an averaged signal and to improve signal interpretation; interpreting the averaged signal and determining whether the discrete values are adequately indicated based on the averaged signal (Note: Claim 11 in Rothberg)

Claims 23, 35, 46, 54 and 65 are rejected for the same reasons as per claim 2.

In regard to **claim 26**, Rothberg teaches: The method of claim 22, wherein the input signal comprises a read signal received from storage medium,

interpreting the input signal comprises determining if the read signal adequately indicates the discrete values, and averaging the multiple signals comprises averaging multiple read signals of the storage medium to improve read signal interpretation. (Note: FIG. 3 and col. 4, lines (13-26) in Rothberg)

Claims 34 and 45, 64 are rejected for the same reasons as per claim 22.

Claims 43, 52, 61, 68 and 72 are rejected for the same reasons as per claim 26.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere CO.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims **3-6, 8, 13-16, 18, 25, 29, 36-41, 47, 48, 51, 55-58, 60, 67 and 71** are rejected under 35 U.S.C. 103(a) as being unpatentable over Rothberg as applied to claim 1 above, and further in view of Takashi et al. U.S. PN: 6,519,715 (Hereinafter as Takashi).

In regard to claim 3, Rothberg teaches substantially all the limitations in claim 1. However, Rothberg does not teach the apparatus of claim 1, wherein the signal from the input comprises an analog signal, the apparatus further comprising a filter and an analog-to-digital Converter (ADC) coupled between the input and the detector. Takashi, in an analogous art that teaches improved reliability of the data recovery processing and data recording from storage medium teaches: The apparatus of claim 1, wherein the signal from the input comprises an analog signal, the apparatus further comprising a filter and an analog-to-digital converter (ADC) coupled between the input and the detector. (Note; Figure 1, reference characters (1), (3) and (4) in Takashi)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Takashi that comprises a filter and an analog-to-digital converter (ADC) coupled between the input and the detector with the teaching of Rothberg.

This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized the need for improved reliability of the data recovery processing and data recording from storage medium.

In regard to **claim 4**, Takashi teaches: The apparatus of claim 3, wherein the buffer is coupled between the ADC and the filter. (Note: FIG. 2, reference character (6) in Takashi)

In regard to **claim 6**, Takashi teaches: The apparatus of claim 3, wherein

the filter comprises a finite impulse response (FIR) digital filter coupled between the ADC and the detector. (Note: col. 8, line 42 in Takashi)

In regard to claim 8, Takashi teaches: The apparatus of claim 1, wherein the detector comprises a Viterbi detector. (Note: FIG. 35, reference character (13) in Takashi)

Claims **13, 38, 47 and 55** are rejected for the same reasons as per claim 3.

Claims **14, 36, 39 and 56** are rejected for the same reasons as per claim 4.

Claims **15, 40 and 57** are rejected for the same reasons as per claim 5.

Claims **16, 25, 48, 58 and 67** are rejected for the same reasons as per claim 6.

Claims **18, 27, 29, 41, 49, 51, 60, 69 and 71** are rejected for the same reasons as per claim 8.

Claim **37** is rejected for the same reasons as per claim 11.

(10) Response to Argument

1. In page 13, Item A of the brief, Appellant cited the following limitation in claim 1, “an error correction circuit responsive to the detector and the averaging circuit to provide a signal quality metric that governs which signals are averaged.” and then cited the rejections being disclosed by Rothberg in col. 3, lines (55-67) and col. 4, lines (27-58) and then concluded “Nothing here teaches or suggest at least an error correction

circuit responsive to the detector and the averaging circuit to provide a signal quality metric that governs which signals are averaged.”

The Examiner asserts that Rothberg teach quality metric that governs which signals are averaged as disclosed in Figure (4) and col. 4, lines (27-35) that implement: “In one embodiment, the averaged values used to assign the binary value to each averaged binary bit is also used to generate an erasure pointer for increasing the number of errors corrected by the error correction code 30. This is illustrated in FIG. 4 which shows a reliability metric generated for each bit in the estimated data sequence 34.

The reliability metric in this embodiment is computed as the averaged value if assigned a "1" bit, and computed as one minus the average value if assigned a "0" bit. “. For Example in figure 4 Rothberg teaches that bits **36_{N-2} and 36_N would not be averaged (would be erased) because each bit has reliability value of 0.4 (less than 0.5).** No further explanation is needed to show that Rothberg teaches substantially every feature in claim 1 and the Appellant has not raised any other issue with respect to the rejection of the independent claims 1, 2 and 11.

2. In regard to the independent claim 12, 21, 22, 34, 45, 53 and 64The Appellant repeated the same point as in claims 1, 2 and 11.
3. In page 20, Item B of the Brief, The appellant states that claims 9, 19, 30, 43, 52, 61 and 72 are rejected based on figure 4 and col. 4, lines (1-27). That is not true, every limitation in claim 9 is rejected with specific

reference to feature (step) in Rothberg, for Example see item 9 in the final office action mailed on 4/30/2008 wherein several reference characters (steps) in Figure 1B has been pointed to each and every limitation in the claim 9.

4. Claims 19, 30, 43, 52, 61 and 72 were rejected for the same reasons as per claim 9.
5. In regard to the dependent claims 3-6, 8, 25 and 29 rejection under 103(a) in view of Rothberg and in further view of Takashi, the Appellant in page 22, Item II of the brief, did not argue the missing limitation in Rothberg that Takashi teaches. However, the Appellant reverted to the “signal quality metric that governs which signals are averaged”. This has been disclosed by Rothberg and not Takashi and further more, this feature is not cited in the dependent claims 3-6, 8, 25 and 29. The appellant has no specific arguments that require Examiner answers.
6. The Examiner thus asserts that Rothberg/Takashi disclosure teaches every limitation of the claimed invention.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner’s answer.

Art Unit: 2112

For the above reasons, it is believed that the rejection should be sustained.

Respectfully submitted,

/Sam Rizk/

Examiner, Art Unit 2112

/Scott T Baderman/

Supervisory Patent Examiner, Art Unit 2114

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